






Psychological Security in the Conditions of using Information and Communication Technologies

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Keywords: Psychological Security, Traditional Learning, Distance Learning, Information and Communication Technologies, Participants of the Educational Process, Teachers of Higher Education Institutions.


Abstract: The article substantiates the relevance and expediency of the study of psychological security of the personality in the conditions of using information and communication technologies (ICT). The purpose of the research is an empirical study of the psychological safety of teachers of higher education institutions in the conditions of using information and communication technologies. The influence of traditional (classroom, offline) and distance (online) types of training on the sense of security of teachers of higher education institutions in the conditions of using ICT is analyzed. Today's realities, in particular the global pandemic caused by the spread of COVID-19 virus infection, have significantly accelerated the introduction and implementation of distance learning and significantly expanded the range of participants in the educational process. Therefore, it has been suggested that teachers of higher education institutions assess traditional (classroom, offline) learning as safer than distance (online). The results of an empirical study of psychological safety in the conditions of using ICT by teachers of higher education institutions are presented. A comparative analysis of the sense of security by teachers of higher education institutions in the context of traditional (classroom, offline) and distance (online) learning was performed. Associations of distance and traditional learning have been found to have significant differences. Groups of concepts in which associations of respondents are invested ("negative", "positive", "neutral") are defined. It is analyzed that associations for the phrase "distance learning", "full-time learning" are located on three semantic "fields": actions, states and characteristics of the referent of the word-stimulus; actions, states and characteristics of other subjects; feelings and emotions. Differences in the perception of distance and traditional learning by teachers depending on the time they spend on online learning were identified. It is determined that the level of psychological security is equally mediocre in both traditional and distance learning. Statistically significant relationships were found between the sense of security in online and offline learning.


1 INTRODUCTION


Scientific and technological progress is rapidly gaining momentum and covers all areas of personality's life activity. Today, no sphere of public life, including educational, is effective without the involvement and implementation of scientific and technical means. The involvement of developments of scientific and technological progress in the educational process is


particularly rapid now – in a global pandemic caused by the spread of viral infection COVID-19 (Pomytkin, 2020; Pomytkin and Pomytkina, 2020; Tkachuk et al., 2021). One of the ways to implement information and communication technologies is the introduction of distance learning (Syvvyi et al., 2020).


Distance learning is defined as an individualized process of acquiring knowledge, skills, abilities and ways of human cognitive activity, which occurs mainly through the indirect interaction of distant participants of the educational process in a specialized environment that operates on the basis of psychological, pedagogical, information and communication technologies (zakon.rada.gov.ua, 2013). We

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can say that distance learning is implemented using a set of modern technologies that ensure the process of providing and receiving information in an interactive mode with the use of information and communication technologies by all participants in the educational process.

It is obvious that the main role in the implementation of distance (online) education, as well as, in fact, traditional (classroom, offline), is played by information and communication technologies. The latter, in turn, are defined as technologies for creating, accumulating, storing and accessing electronic resources of educational programs and training materials, providing and supporting the educational process using specialized software and means of information and communication, including the Internet (zakon.rada.gov.ua, 2013). It is the Internet that reveals the possibilities of virtual connection and communications.

2 LITERATURE REVIEW

Almarashdeh (Almarashdeh, 2016), Barvinskaya (Barvinskaya, 2020), Bobyliev and Vihrova (Bobyliev and Vihrova, 2021), Bykov et al. (Bykov et al., 2001), Chernyshov (Chernyshov, 2021), Dos Santos (Dos Santos, 2020), Duell (Duell, 2008), Finley (Finley, 2012), Gajek (Gajek, 2018), Giest (Giest, 2004), Giest (Giest, 2008), Karadeniz (Karadeniz, 2009), Kukhareno and Oleinik (Kukhareno and Oleinik, 2019), McGinnis (McGinnis, 2010), Mills (Mills, 1997), Rourke and Anderson (Rourke and Anderson, 2002), Seguin (Seguin, 2021), Sezer (Sezer, 2016), Teplow (Teplow, 1996), Traxler (Traxler, 2018), Weety (Weety, 1998), Wells (Wells, 2021) conducted scientific research in the direction of theoretical, empirical and social aspects of the introduction of distance learning, analyzed the problems of the introduction of distance learning and the features of the involvement of information and communication technologies.

Empirical research on educational technologies used in distance learning has become widely known. In particular, Anderson and Rivera-Vargas (Anderson and Rivera-Vargas, 2020) identified and critically substantiated the main dimensions of using digital technologies in distance education, which led to significant changes, namely: reducing the quality of education; restriction of application of new knowledge development methods; copyright infringement; excessive idealization of information and communication technologies; violation of private information due to the widespread use of social media in distance educa-

tion (Anderson and Rivera-Vargas, 2020).

At the same time, Anderson (Anderson, 2019) notes that social media, as a tool of information and communication technologies, is a major component of commercial, entertainment and, of course, educational activities. Education has a unique opportunity to control and improve their own practices through the dissemination of social media, which are effective for all participants of the educational process. In particular, teachers, educators and mentors have additional opportunities to communicate with students. An important aspect of this connection is the control and intervention in the learning process in order to increase the effectiveness of both teaching and learning. New ways of finding, receiving and exchanging educational information are becoming available for learners (pupils, students) (Anderson, 2019).

Sancho-Gil et al. (Sancho-Gil et al., 2020), Pomytkin et al. (Pomytkin et al., 2020) point out that the development of ICT has caused excessive concern about its ability to solve educational problems and improve the quality of learning. Such a situation requires the development and implementation of new digital technologies in education for effective digital inclusion in order to expand public knowledge about the possibilities of using information technology in the educational environment.

The urgent need for the implementation and implementation of distance learning creates excessive excitement and uncertainty among all participants of the educational process. Thus, Anderson (Anderson, 2019) notes that the main difference between distance learning and traditional is the exhaustion of its participants.

Distance learning, accompanied by the intensive use of information and communication technology tools, in particular, the inclusion in the digital information environment of participants of the educational process, leads to a deterioration in psychological well-being and information stress. The latter, in turn, is associated with the long-term use of information and communication technologies, in particular, the Internet (Kislyakov, 2020).

Social networks, watching news, consuming information, etc. lead to increased information stress and reduce the level of psychological security of the personality. The problem of information and psychological security is related to such psychological aspects as the perception, preservation, processing and use by participants in the educational process of a certain information array (Krasnyanskaya and Tylets, 2019).

The concept of psychological security can be described as a state of psychological safety and the abil-

ity of the personality to withstand unpleasant external and internal influences. Psychological security is an important factor of interpersonal interaction (Edmondson, 1999, 2004). The latter is significantly reduced in terms of distance learning, which is confirmed by scientific research. A study (Hu et al., 2018) reported that the lower the level of psychological security of the personality, the higher the level of distance interaction. The dependence of a sense of psychological security in terms of distance or traditional learning is evidenced by the results of several studies. In particular, the relationship between psychological security and social networks is revealed (Soares and Lopes, 2014), which is one of the main tools of interaction between participants in the educational process in distance learning.

Given the significant amount of research on the study of psychological security and information and communication technologies, the aspect of psychological safety of teachers of higher education institutions in the conditions of using ICT remains insufficiently studied.

The *purpose* of the research is an empirical study of the psychological safety of teachers of higher education institutions in the conditions of using information and communication technologies. In our study, we made assumptions that the teachers of higher education institutions evaluate traditional (classroom, offline) learning safer than distance (online) learning.

3 RESEARCH METHODS

The study of psychological safety in the use of ICT was implemented during the autumn semester of 2020. Teachers of higher education institutions ($N = 59$) took part in the study, including 48 women (81%) and 11 men (11%). The age of respondents varies between 25–75 years, the largest share are teachers aged 25–44 years (75%), 11 teachers aged 45–60 years (19%) and 4 teachers aged 61–75 years (7%).

To study the features of psychological safety in traditional (classroom, offline) and distance (implemented as a measure to combat the spread of coronavirus disease (COVID-19)) forms of studying was developed and implemented author's questionnaire "Psychological security in conditions of using ICT". Its validity and reliability were ensured by using the method of independent expert evaluations. The questionnaire contained three components that assess both the conditions of distance learning and its psychological component: determining the intensity of involvement in distance learning (time spent), the study of as-

sociations on different forms of learning and the subjective level of psychological security (on a five-point scale) during distance and full-time forms of education.

The method of frames (schemes) was used for qualitative and quantitative analysis of associations. This method allows you to group associations by certain descriptive characteristics that can be applied to abstract concepts: 1) actions, states and characteristics of the word-stimulus, 2) actions, states, characteristics of other subjects, 3) feelings and emotions (Mironova, 2011) and the method of expert assessments. Methods of mathematical statistics were used for statistical processing of the obtained quantitative data (descriptive statistics, comparison of dependent samples (Student's t-criterion), Spearman's rank correlation analysis). Automated data processing was performed using the IBM SPSS Statistics 26 and the ArcGIS software packages.

4 RESULTS AND DISCUSSIONS

According to the results of empirical research, the frequency hierarchy of associations for the phrases "distance learning" and "full-time learning" was revealed. Analysis of the results shows that teachers of higher education institutions associate the phrase "distance learning" primarily with ICT: "computer" (6%), "Internet" (6%), "Moodle, Classroom, Viber" (4%); with an evaluative attitude: "fast" (4%), "imperfect" (4%), also significant is the affective component, which has a negative emotional color: "stress" (4%).

The hierarchy of associations for the phrase "full-time education" differs significantly from the previous one. The main associations are aimed at interaction, and interpersonal connection – "communication" (17%); identification of specific characteristics of direct interaction – "live communication" (13%), "communication" (6%), "knowledge" (6%).

Qualitative analysis of reactions (associations) based on the method of frames (Mironova, 2011) allowed to make their qualitative characteristics.

Field 1. Actions, states and characteristics of the word-stimulus. The phrase-stimulus "distance learning" is expressed through actions, states and characteristics that describe the effectiveness of distance learning, its impact on the physical and mental state of the respondent: for example, "inappropriate", "undesirable", "low efficiency", "exhausting", "long", "simple", etc. The characteristics of the phrase-stimulus "full-time learning" mostly reflect its focus on the communicative process, such as "communication", "live communication", "energy of live commu-

nication”, “simple”, “fast”.

Field 2. Actions, states, characteristics of other subjects. In the associative chain of the phrase-stimulus “distance learning”, the interiorization is traced: the “other subject” is the respondent (for example, “insomnia”, “control”, “day mode”, “sleep”). At the same time, in the associative chain for the phrase-stimulus “full-time study”, respectively - exteriorization (for example, “students”, “I know where the child is”, “friends”, “noise”, “fun”, “long time to get to”, “waste of time”).

Field 3. Feelings and emotions. The associative chain of the phrase-stimulus “distance learning” is characterized by the narrowness and uniformity of emotional characteristics, such as “sadness”, “worrying”, and so on. The associative chain of the phrase-stimulus “full-time learning” is dominated by concepts that characterize feelings and emotions. They differ in variety and bright emotional color, such as “fun”, “contact”, “attentive”, “emotions”.

With the help of expert assessments, the associations were grouped into three groups: “negative”, “positive” and “neutral”. Negative associations include those that have an expressed negative evaluation attitude or emotional coloring, such as “sadness”, “horror”, “forced step”, “low efficiency”, and so on. Neutral associations include those that reflect events, objects, phenomena, objective reality, such as the “Internet”, “audience”, “Zoom”, etc. Positive associations include those that have a positive emotional color or evaluation, such as “fun”, “live communication”, “good feedback”, and so on. By assigning a numerical value to each group of associations (“0” = “negative”, “1” = “neutral”, “2” = “positive”) and using methods of statistical data processing, it was found that associations of teachers of higher education institutions regarding distance and traditional education differ significantly ($t = -4.801, p \leq 0.012$) (table 1).

It should be noted that in each of the three fields, respondents focused on the concept of time spent on distance and full-time study and their characteristics, such as “more time for themselves”, “fast”, “slow”, “waste of time”, “all day”, “round-the-clock access”, “work after work”, “no waste of time”, etc. Peculiarities of the perception of distance learning by employees of higher education institutions depending on how much time they spent on average during the working week on distance learning are presented in table 2.

The most negative perception of distance learning is perceived by respondents who have been involved in it for less than 6 hours (58.3%). Respondents who spend more than 18 hours a week on distance learning also rate it rather negatively. The smallest num-

ber (32.0%) of negative associations regarding distance learning have respondents who are involved in it for 6–18 hours. It should be noted that the more respondents were involved in distance learning, the less positive (4.5%) and more neutral (50.0%) associations they have with it.

Those who spend an average of 6 to 18 hours a week on distance learning tend to describe it most positively.

The results of the analysis of associations for the phrase-stimulus “full-time learning” are fundamentally different from the previous ones (table 3). Most positive associations (40.9%) regarding full-time education occur in teachers who spend the most time (more than 18 hours) on distance learning, and the least – in those who worked distantly the least (6 hours per week). The vast majority (61%) of respondents generally have a neutral perception of traditional (classroom, offline) learning. It is worth noting much lower rates of negative associations with the phrase-stimulus “full-time learning”, compared with distance (respectively, 3.4% and 42.4%).

For a more detailed interpretation of the peculiarities of the perception of distance and full-time learning, the subjective level of psychological security feeling of teachers of higher education institutions during the implementation of both forms of education was determined (table 4). In general, respondents rate their level of psychological security as equally mediocre in distance and full-time learning ($\bar{x} = 2.808$ and $\bar{x} = 2.900$, respectively).

However, we observe contradictions between the emotional perception of online/offline learning and the assessment of their own psychological security in their implementation depending on the time of using ICT. Thus, full-time learning is assessed as the most dangerous ($\bar{x} = 3.307$) by teachers who are most positive about it, and who spend more than 18 hours a week on distance learning. The least dangerous ($\bar{x} = 2.423$) full-time learning is for teachers who are involved in distance learning for less than 6 hours. The most dangerous ($\bar{x} = 3.305$) feel in the online environment those who spend from 6 to 18 hours on it.

To find significant differences between the indicators of experiencing a sense of security in the implementation of online/offline learning by teachers of higher education institutions we used calculations of the Student’s t-criterion (table 5). No statistically significant differences were found, but some trends were indicated: teachers who are involved in distance learning for less than 6 hours tend to perceive the online environment as safer ($t = 1.442, p \leq 0.175$), those who work from 6 to 18 hours, on the contrary, as more dangerous ($t = -1.51, p \leq 0.144$). Those

Table 1: Differences in associations of employees of higher education institutions about full-time and distance learning.

Paired Samples Test								
Distance / full time	Paired Differences					t	df	Sig. 2-tailed
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
	-.593	.949	.123	-.840	-.345	-4.801	58	.012

Table 2: Emotional perception of distance learning by teachers with different times of using ICT.

Crosstabulation			Associations to the phrase-stimulus "distance learning"			Total
			Negative	Neutral	Positive	
Term of online study (hours)	Less than 6	Count	7	3	2	12
		% within	58.3	25.0	16.7	100.0
	6-18	Count	8	11	6	25
		% within	32.0	44.0	24.0	100.0
	More than 18	Count	10	11	1	22
		% within	45.5	50.0	4.5	100.0
Total		Count	25	25	9	59
		% within	42.4	42.4	15.3	100.0

Table 3: Emotional perception of full-time learning by teachers with different time of using ICT.

Crosstabulation			Associations to the phrase-stimulus "full-time learning"			Total
			Negative	Neutral	Positive	
Term of online study (hours)	Less than 6	Count	1	7	4	12
		% within	8.3	58.3	33.3	100.0
	6-18	Count	1	16	8	25
		% within	4.0	64.0	32.0	100.0
	More than 18	Count	0	13	9	22
		% within	0.0	59.1	40.9	100.0
Total		Count	2	36	21	59
		% within	3.4	61.0	35.6	100.0

who spent more than 18 hours distantly mediocly assessed their own safety both offline and online ($t = -0.731, p \leq 0.473$).

Spearman's correlation analysis was used for a more detailed interpretation (table 6). It was found that there is a statistically significant relationship between indicators of psychological safety in distance and offline learning for both respondents of the general sample ($r = 0.358, \rho \leq 0.001$) and teachers who are involved distantly for 6-18 hours ($r = 0.528, \rho \leq 0.001$). We do not observe such correlations in respondents who are engaged in online learning for a small or extremely large amount of time.

As the result of the study it was determined that the feeling of psychological security and the perception of teachers of higher education institutions about distance and traditional learning have certain specific characteristics.

5 CONCLUSIONS

1. Psychological security is defined as a state of psychological protection from external and internal influences. In the conditions of distance learning the feeling of psychological safety of its participants decreases, in comparison with the conditions of traditional (classroom) learning.
2. There are differences in the perception of distance and traditional (full-time) learning among teachers of higher education institutions. Associations for the phrase "distance learning", "full-time learning" are located in three semantic "fields": teachers of higher education institutions associate distance learning with ICT and with feelings and emotions, full-time learning is associated with communication and interaction with others. There is a significant difference between distance and traditional learning associations: distance learn-

Table 4: Level of psychological safety of teachers of higher education institutions (\bar{x}).

Term of online learning (hours)	Online (distance) learning	Offline (full-time) learning
Less than 6	2.820	3.307
6-18	3.305	2.694
More than 18	2.576	2.423
Total	2.900	2.808

Table 5: The sense of security features of higher education institutions teachers with different time of using ICT in the conditions of online/offline learning.

Paired Samples Test								
Term of online training (hours)	Paired Differences					t	df	Sig. 2-tailed
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Total	-.084	1.734	.225	-.536	.367	-.375	58	.709
More than 18	-.272	1.750	.373	-1.048	.503	-.731	21	.473
6-18	-.416	1.348	.275	-.986	.152	-1.51	23	.144
Less than 6	.846	2.115	.586	-.432	2.124	1.442	12	.175

Table 6: Relationships between psychological safety indicators in online/offline learning.

Sample/term of online training (hours)		Offline/Online	
Spearman's rho	Total sample	Correlation Coefficient	.358**
		Sig. (2-tailed)	.005
		N	59
	More than 18	Correlation Coefficient	.241
		Sig. (2-tailed)	.280
		N	22
	6-18	Correlation Coefficient	.528**
		Sig. (2-tailed)	.008
		N	24
	Less than 6	Correlation Coefficient	.327
		Sig. (2-tailed)	.276
		N	13

** Correlation is significant at the 0.01 level (2-tailed).

ing is perceived more negatively than full-time learning.

- There is a statistically significant relationship between the feeling of psychological security of respondents in distance learning and the feeling of psychological security in offline learning. The subjective level of feeling of psychological security has average indicators, both in terms of distance and full-time learning. Teachers who spend a lot of time online tend to perceive more dangerous full-time learning. The least dangerous are those who are involved in distance learning for a short time. The most dangerous in the online environment feel those who spent on it an average of 6 to 18 hours.
- Contradictions between the emotional perception of online/offline learning and the assessment of the level of their own psychological security in

their implementation depending on the time of using ICT were defined.

The research hypothesis was partially proved. We see *prospects for further research* in the study of the features of psychological security of all participants in the educational process in a wide sample.

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